

COVINGTON & BURLING

1201 PENNSYLVANIA AVENUE, N. W.

P.O. BOX 7566

WASHINGTON, D.C. 20044-7566

(202) 662-6000

FACSIMILE: (202) 662-6291

J.T. SMITH II

DIRECT DIAL NUMBER

(202) 662-5555

DIRECT FACSIMILE NUMBER

(202) 778-5555

jtsmith@cov.com

April 17, 1998

VIA FEDERAL EXPRESS

John Kemmerer
Chief, Superfund Site
Cleanup Branch
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA. 94105-3901

Dear Mr. Kemmerer:

This letter responds to your request of March 11, 1998, to Patrick Corbett of Kerr-McGee Chemical LLC (KMCLLC), successor via merger to Kerr-McGee Chemical Corporation, seeking information pursuant to Section 104(e) of CERCLA and Section 3007 of RCRA regarding production and use of perchlorate-containing chemicals. KMCLLC has endeavored to answer each of your questions to the best of its ability, based upon information that could be obtained in the time allowed for KMCLLC to respond.

We are continuing research on the historical ownership and operations of KMCLLC's Henderson, Nevada facility, including the role of the federal government in the period 1945-62. For instance, it appears that during this period the United States Navy played a significant role in ownership and operation of a plant for production of ammonium perchlorate and that a senior naval officer was assigned to this facility until 1962. KMCLLC reserves the right to amend or supplement its answers based upon the fruits of ongoing research.

1. What year did production of perchlorate-containing chemicals begin?

At Henderson, Nevada, production of potassium perchlorate began in 1945, and production of ammonium perchlorate began on a pilot scale basis in 1948, with full commercial scale production beginning in 1951. Also, production of sodium perchlorate began in 1945 for use as a precursor in production of potassium perchlorate.

LECONFIELD HOUSE

CURZON STREET

LONDON W1Y 8AS

ENGLAND

TELEPHONE: 44-(0)-495-5655

FACSIMILE: 44-(0)-495-3101

KUNSTLAAN 44 AVENUE DES ARTS

BRUSSELS 1040 BELGIUM

TELEPHONE: 32-2-549-5230

FACSIMILE: 32-2-502-1598

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2. What entities have owned/operated the plant? Please provide the dates when ownership or operating control changed.

KMCLLC's Henderson facility was originally owned and constructed by the Defense Plant Corporation (DPC) acting for the U.S. government in 1941. From August 1942 until November 1944, the plant was operated by Basic Magnesium Incorporated on behalf of the U.S. government to manufacture magnesium that was used in aircraft production. The magnesium plant closed in November 1944, and the federal Reconstruction Finance Corporation (RFC) assumed control of the plant from the DPC. The RFC relinquished custody of the plant to the federal War Assets Administration in October 1946. In June 1949, most of this overall industrial complex was transferred to the Colorado River Commission (CRC), an instrumentality of the State of Nevada. As noted below, the CRC conveyed a portion of the site to Western Electro Chemical Company (WECCO) in 1952. The United States apparently retained or regained ownership of a substantial portion (290.33 acres) for which it did not relinquish ownership finally until March 1962, when this acreage was conveyed to the American Potash and Chemical Corporation (AP&CC).

WECCO was the first privately owned company to operate on the site that was to become the KMCLLC facility. It operated at the site from approximately 1945 through 1955. In May 1945, WECCO contracted with the DPC for the production of perchlorates for the U.S. Department of the Navy. Operations began by June or July 1945, but ceased right after the war's end in August 1945. Subsequently, WECCO resumed operations under a lease from the RFC in February 1946. WECCO acquired portions of the site from the CRC in May 1952.

As previously noted, the U.S. Navy remained active at the site until 1962. Apparently, the Navy spent \$8 million to construct an ammonium perchlorate plant at the site in an area separate from the WECCO-owned chlorate and perchlorate units that were converted from the WW II plant, and it was this plant that was used by KMCLLC to produce ammonium perchlorate. WECCO, and then AP&CC, operated this plant under contract for the Navy, which apparently retained ownership and a supervisory role through a Navy Captain assigned to the site. It is likely that this plant occupied the 290.33 acres for which the United States finally relinquished ownership in 1962.

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In 1955, WECCO was merged with AP&CC, and the merged entity continued the production of chlorates and perchlorates. KMCLLC acquired the present facility from AP&CC in 1967 by means of a merger.

3. Which specific perchlorate-containing compounds were manufactured?

Sodium perchlorate, potassium perchlorate, ammonium perchlorate, and magnesium perchlorate.

4. What was the total annual production of perchlorate-containing compounds at the plant in Henderson, Nevada? What was the annual production of each specific perchlorate-containing compound?

See Attachment 1. Figures are not readily available for potassium perchlorate production or ammonium perchlorate production between 1945-1951. Also, as previously noted, sodium perchlorate manufacture began in 1945 as a precursor to the production of potassium perchlorate. No separate production figures exist for such precursor sodium perchlorate. KMCLLC began manufacture of sodium perchlorate for end uses in 1968.

5 & 6. What were the end uses of the perchlorate-containing compounds and what was the approximate percentage of production sold for each of the end uses?

- a. Sodium perchlorate -- precursor to potassium and ammonium perchlorate, and explosives.
- b. Potassium perchlorate -- solid rocket fuel oxidizer, flares, and pyrotechnics.
- c. Ammonium perchlorate -- solid rocket fuel oxidizer, explosives, chemicals and pyrotechnics.
- d. Magnesium-perchlorate -- military batteries.

End-use information for 1997 is deemed to be reasonably reflective of historical uses. In 1997, 87% of production went for use as rocket fuel; 8% for

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use in explosives, and 5% as a chemical feedstock. Historic use in flares and pyrotechnics would have been relatively small.

7. Please provide the name and address of each entity to whom perchlorate-containing compounds were shipped each year from the Kerr-McGee facility (more than 500 pounds in any year)?

See Attachment 2. The customer names and addresses furnished

to Kerr-McGee LLC shipments from 1978 through the present. Customer records antedating 1978 are not readily available. Normal retention of such sales data by KMCLLC is 10 years.

8. Please identify the locations of other perchlorate-containing chemical production facilities owned, operated or previously owned or operated by Kerr-McGee in the United States?

There have been none.

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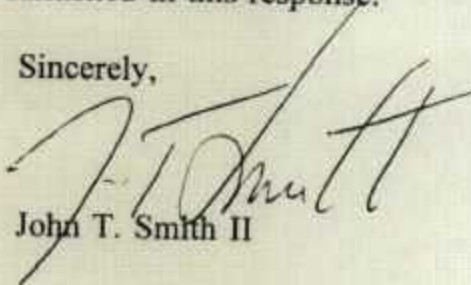
other facilities that have produced perchlorate compounds. (The dates for production at these facilities are estimates.). They are:

1. Western Electro Chemical Company, 1941-48, Los Angeles, California.
2. Hooker Chemicals (now Oxychem), approximately 1940-75, Niagara Falls, New York.
3. HEF, Inc. -- Hooker Chemical & Foote Mineral (now Eka Nobel), 1958-65, Columbus, Mississippi.
4. Pennsalt (Pennwalt), now Elf Atochem, 1958-65, Portland, Oregon.

* * * *

Again, KMCLLC intends to supplement this response with any additional information that its ongoing research may reveal. Please let me know if EPA has any questions about the information furnished in this response.

Sincerely,



John T. Smith II

Attachments (2)

cc: Douglas Zimmerman, NDEP -- By Federal Express

ATTACHMENT 1

Perchlorate Chemical Production - Henderson, NV 1951-1997

4/3/90

| YEAR | PRODUCT | | | |
|------|-------------|-------------|-------------|-------------|
| | SODIUM | AMMONIUM | MAGNESIUM | POTASSIUM |
| | PERCHLORATE | PERCHLORATE | PERCHLORATE | PERCHLORATE |
| 1951 | - | 379 | - | 3,077 |
| 1952 | - | 1,218 | - | 3,805 |
| 1953 | - | 1,571 | - | 3,562 |
| 1954 | - | 3,974 | - | 158 |
| 1955 | - | 3,239 | - | 651 |
| 1956 | - | 3,738 | - | 490 |
| 1957 | - | 3,427 | - | 336 |
| 1958 | - | 6,746 | - | 309 |
| 1959 | - | 10,888 | - | 378 |
| 1960 | - | 5,600 | - | 150 |
| 1961 | - | 10,279 | - | 122 |
| 1962 | - | 8,511 | - | 206 |
| 1963 | - | 11,220 | - | 117 |
| 1964 | - | 9,240 | - | 222 |
| 1965 | - | 3,841 | - | - |
| 1966 | - | 6,511 | - | 161 |
| 1967 | - | 8,456 | - | 304 |
| 1968 | 113 | 5,893 | - | 465 |
| 1969 | 71 | 6,001 | 12 | 535 |
| 1970 | 375 | 7,692 | 8 | 516 |
| 1971 | 142 | 3,835 | - | 344 |
| 1972 | 61 | 7,576 | 180 | 463 |
| 1973 | 75 | 6,781 | 247 | 526 |
| 1974 | 82 | 6,163 | 249 | 768 |
| 1975 | 41 | 4,443 | 42 | 266 |
| 1976 | 142 | 5,152 | (8) | 763 |
| 1977 | 416 | 5,857 | - | 949 |
| 1978 | 333 | 5,151 | - | 782 |
| 1979 | 804 | 6,542 | - | 830 |
| 1980 | 1,383 | 6,282 | - | 524 |
| 1981 | 1,567 | 6,174 | - | 386 |
| 1982 | 942 | 7,075 | - | 359 |
| 1983 | 841 | 8,531 | - | (2) |
| 1984 | 1,366 | 12,366 | - | - |
| 1985 | 1,878 | 14,116 | - | - |
| 1986 | 1,269 | 14,758 | - | - |
| 1987 | 1,061 | 14,053 | - | - |
| 1988 | 1,346 | 15,368 | - | - |
| 1989 | 262 | 18,033 | - | - |
| 1990 | 279 | 18,478 | - | - |
| 1991 | 356 | 10,803 | - | - |
| 1992 | 472 | 7,179 | - | - |
| 1993 | 734 | 8,920 | - | - |
| 1994 | 829 | 10,919 | - | - |
| 1995 | 681 | 6,010 | - | - |
| 1996 | 684 | 4,214 | - | - |
| 1997 | 735 | 5,303 | - | - |

Perchlorate Company Names/Addresses

cpa

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|-------------------|--|
| Alabama | |
| "Ship co" | <u>Name/address</u> |
| Huntsville | Thiokol Corporation Plant closed. Current address of related division--PO Box 707, Brigham City, UT 84302-0707 |
| Parrish | Boren Ireco (formerly Gulf & Thermex), 8425 Hwy 269, Parrish, Ala 35580 |
| Redstone | U. S. Army, Redstone Arsenal, Al 35898-5330 |
| Bessemer | Hercules, Inc. Now Alliant Tech --see Utah Division address |
| Arkansas | |
| E. Camden | Atlantic Research Corp., PO Box 1036, Camden, AR 71701 |
| E. Camden | Mining Services International, address not available |
| Woodbury | Hitech Inc., PO Box 3112, East Camden, AR 71701 |
| Midland | SECO Inc., Austin Powder, 25800 Science Park Dr., Cleveland, O 44122 |
| Arizona | |
| Goodyear | Unidynamics, 102 S. Litchfield Rd., Goodyear, AZ 85338 |
| Mesa | Talley Defense Systems, Inc., PO Box 849, Mesa, AZ 85211 |
| Tempe | Aerodyne Corp., PO Box 725, Tempe, AZ 85281 |
| Chandler | Aerodyne Corp., PO Box 725, Tempe, AZ 85281 |
| Phoenix | Universal Propulsion, 25401 N. Central Ave., Phoenix, AZ 85027 |
| California | |
| Aliso Viejo | G. G Industries, PO Box 8065, Laguna Hills, CA 92654 |
| Auburn | Mason Holodyne, 90 Pinecrest Dr., Applegate, CA 95703 |
| Barstow | Roy's Gun and Lock, address not available |
| Barstow | Mojave Pyrotechnic, address not available |
| China Lake | Naval Air Warfare Center, 671 Nimitz, China Lake, CA 93555 |
| Edwards AFB | Edwards AFB, CA 93523 |
| Gardena | T.O.P.T.H., 2848 E. 208th St., Long Beach CA 90810 |

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| Calif. cont. | |
| Hollister | Quantic Industries, 990 Commercial St., San Carlos, CA 94070 |
| Hollister | FMC, 900 John Smith Rd., Hollister, CA 95023 |
| Hollister | (formerly Halex) Whittaker Ordnance, PO Box 148, Hollister, CA 95024 |
| Huntington Beach | Milco International, address not available |
| Ione | M. P. Associates, PO Box 546, Ione CA 95640 |
| Llano | Odee Mfg. Co., address not available |
| Long Beach | T.O.P.T.H., 2848 E. 208th St., Long Beach CA 90810 |
| Middletown | Reynolds Systems, FMC, PO Box 367, San Jose, CA 95103 |
| Morgan Hill | Olin Corporation, PO Box 727, Morgan Hill, CA 95037 |
| Nimbus | Aerojet Propulsion Division (Gentech), PO Box 1322, Sacramento, CA 95813 |
| Norwalk | Trojan Fireworks, PO Box 2329, Rialto, CA 92376 |
| Ontario | Dynamic Propellant, 4748 Mission Blvd. #D., Ontario, CA 91762 |
| Pasadena | Jet Propulsion Lab, 4800 Oak Grove Dr., Pasadena, CA 91109 |
| Pomona | U. S. Rocket, PO Box 1242, Claremont, CA 91711 |
| Redwood City | Mason Holodyne, 90 Pinecrest Dr., Applegate, CA 95703 |
| Rialto | Astro Pyrotechnics (formerly Trojan Fireworks), PO Box 2329, Rialto CA 92376 |
| Riverside | McKesson Chemical Co., 689 Iowa, Riverside CA 92507 |
| Riverside | Universal Propulsion, 25401 N. Central Ave., Phoenix, AZ 85027 |
| San Jose | Pratt & Whitney (formerly UTC), PO Box 49208, San Jose, CA 95161-9028 |
| Saugus | Hi Shear Industries, 2830 W. Lomita Blvd., Torrance CA 90505 |
| Saugus | Bermite Div., Whittaker Corp., 22116 W. Soledad Canyon Rd., Saugus, CA 91350 |
| Tracy | Lawrence Livermore, U of CA National Lab, PO Box 5001, Livermore, CA 94551 |
| Whittier | Whittier Chemical Co., address not available |
| Windsor | Starflight Systems, 7714 Bell Rd., Windsor, CA 95492 |

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| Colorado | |
| Englewood | Gateway Safety Products, address n/a |
| Penrose | Estes Industries, PO Box 227, Penrose, CO 81240 |
| Whitewater | KSI Inc., 1471 Blair Rd. Whitewater, CO 81527 |
| Colo. Springs | Vulcan Systems, PO Box 6099, Colorado Springs, CO 80934 |
| Florida | |
| Brooksville | Thermex Energy, 13601 Preston Rd., Suite 900 West, Dallas, Tx 75240 |
| Hollywood | CCT, address n/a |
| Eglin | Eglin AFB, Eglin, FL 32542 |
| Georgia | |
| Byron | ICI Americas (formerly Pyrotechnic Specialties), PO Box 819, Valley Forge, PA 19482 |
| Idaho | |
| Pocatello | Firefox Enterprises, 11612 North Nelson Lane, Pocatello, Idaho 83202 |
| Illinois | |
| Marion | Olin Corp., PO Box 278, Marion IL 62959 |
| Chicago | Harold Dunbar Paper Co., address n/a |
| South Beloit | Lakeside Fusee, address n/a |
| Danville | World Fireworks, address n/a |
| Danville | Star Fireworks, address n/a |
| Edwardsville | Propeller, PO Box 387, Edwardsville, IL 62025 |
| Joliet | Talley Defence Systems, PO Box 849, Mesa, AZ 85211 |
| Indiana | |
| Peru | Olin Corp., RR 6 Box 542, Peru, IN 46970 |
| Kingsbury | Melrose Fireworks, PO Box 302, Kingsbury, In 46345 |
| Kingsbury | Aerial Dynamics, PO Box 304, Kingsbury, IND 46345 |
| Kingsbury | Kingsbury Industries, address n/a |
| Kansas | |
| Hallowell | Thermex (formerly Gulf Oil), 13601 Preston Rd., Suite 900 W., Dallas TX 75240 |
| Hallowell | Slurry Explosives (formerly El Dorado), PO Box 348, Columbus, KS 66725 |

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| Kansas cont. | |
| Herrington | Hodgdon Powder/ Pyrodex Corp., address n/a |
| Louisiana | |
| New Orleans | Bartlett Chemicals, address n/a |
| Michigan | |
| Isipeming | Ireco Inc., 11th Floor Crossroads Tower, Salt Lake City, U 84144 |
| Mississippi | |
| Foxsworth | Rebel Fireworks, Inc., address not available |
| Maryland | |
| Indian Head | Naval Surface Warfare Center, 202 Strauss Ave., Indian Head, MD 20640 |
| Elkton | Thiokol Corp., PO Box 241, Elkton, MD 21922 |
| Elkton | New Jersey Fireworks, Mfg., address n/a |
| Cumberland | Alliant Tech (formerly Hercules, Inc.), current address W. Va. |
| Easton | Samuel Jackson Fusee Co., address n/a |
| Silver Springs | Naval Surface Warfare Center, 10901 New Hampshire Ave., Silver Springs, MD 20903 |
| Minnesota | |
| Biwabik | Thermex Energy, 13601 Preston Rd., Suite 900 W., Dallas, TX 75240 |
| Biwabik | Nitrochem Energy Corp., PO Box B, Biwabik, Minn 55708 |
| Gilbert | Cook Slurry, Cook Associates, 2026 Beneficial Life Tower, 3650 State St., SLC, Utah 84111 |
| Foley | Aerial Arts, 18355 165th St. NE, Foley, Minn 56329 |
| Missouri | |
| Joplin | Atlas Powder, PO Box 87, Joplin, MO 64801 |
| Joplin | ICI, PO Box 819, Valley Forge, PA 19482 |
| Atlas | Atlas Powder, PO Box 87, Joplin, MO 64801 |
| New Jersey | |
| Newfield | Shieldalloy Corp., 12 West Blvd., PO Box 768, Newfield, NJ 08344-0768 |
| South Plainfield | Hummel Croton, Inc., PO Box 250, So. Plainfield, NJ 07080 |
| Boonton | Standard RWY Fusee Co., address n/a |

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| New Jersey cont. | |
| Orange | H. Reisman Corp., 377 Crane St., Orange, NY 07051 |
| Newark | Fairmount Chemical, address n/a |
| Nevada | |
| Sparks | Hi Shear Industries, 2830 W. Lomita Blvd., Torrance CA 90505 |
| Las Vegas | Aerotech/ISP, 1955 S. Palm, Suite 5, Las Vegas, NV 89104 |
| Lockwood | Largo Marsino, Defense Supply, 204 Edison Way, Reno, NV 89502 |
| Fernley | BOKMA Resources, PO Box 590, Fernley, NV 89408 |
| New Mexico | |
| Roswell | Longhorn Mfg. Co., address not available |
| New York | |
| Brooklyn | Witco Chemical Corp., 700 Court St., Brooklyn, NY 11231 |
| Delanson | Fireworks by Grucci, One Grucci Lane, Brookhaven, NY 11719 |
| North Carolina | |
| McCleansville | Gulf Oil, Po Box 183, McCleansville, NC 27301 |
| Riegelwood | Wright Chemical, Atlas Powder, PO Box 271, Tamaqua, PA 18252 |
| North Dakota | |
| Fargo | Starr Display Fireworks, PO Box 9574, Fargo, ND 58106 |
| Kindred | Dakota Pyrotechnic, 16250 57th S. E., Kindred, ND 58051 |
| Harwood | Starr Display Fireworks, PO Box 9574, Fargo, ND 58106 |
| Ohio | |
| Columbus | G. F. Smith Chemicals, PO Box 245, Powell, Ohio 43065 |
| Cincinnati | Fanaco Inc., address n/a |
| Steubenville | Barium & Chemicals, address n/a |
| Fostoria | Standard RWY Fusee Co., address n/a |
| Marietta | Servo Dynamics, sec Corpus Christi address |
| Lisbon | Hilltop Energy Inc., An/Gel International, 33 C. St., Salt Lake City, U 84103 |

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| Pennsylvania | |
| Hatfield | Aerial Arts, 18355 165th NE, Foley, Minn. 56329 |
| Telford | Service Chemical Inc., address n/a |
| Tamaqua | Atlas Powder Co., PO Box 271, Tamaqua, PA 18252 |
| Mt. Carmel | Explo-Tech, Inc., An/Gel Int., 33 C. St., SLC, U 84103 |
| Kittanning | KESCO Inc., PO Box 95, Adrian, Pa 16210-0095 |
| South Carolina | |
| Columbia | Phillips Components, 6071 St. Andrews Rd., Columbia, SC 29212 |
| Tennessee | |
| Toone | Kilgore Corp., Kilgore Drive, Toone, TN 38381 |
| Louisville | Southwestern Energy, An/Gel International, 33 C. St., SLC, U 84103 |
| Texas | |
| Karnack | Thiokol Corp. Plant closed—see address for Utah division |
| Corpus Christi | Servo Dynamics, Inc., Rt. 1, Box 132 E. Roddfield, Corpus Christi, TX 78414 |
| McGregor | Alliant Tech (formerly Hercules, Inc.) Plant closed—see address for Utah division |
| Kennedale | Harrison Jet Guns, 6915 Hudson Village Creek Rd., Kennedale, TX 76060 |
| Mansfield | Shaped Charge Specialties, address not available |
| Marshall | RTF Enterprises, address n/a |
| Rosharon | Slumberger, PO Box 1590, Rosharon, TX 77583 |
| Houston | Thermex (formerly Gulf), 13601 Preston Rd., Suite 900 West, Dallas, TX 75240 |
| Waco | M & M Chemical, 103 Stovall, Waco TX 76706 |
| Utah | |
| Magna | Alliant Tech, PO Box 98, Magna UT 84044 |
| Brigham City | Thiokol Corporation, PO Box 707, Brigham City, UT 84302 |
| Logan | Fireworks West, address n/a |
| Lehi | Dyno Nobel (formerly Ireco), 11th Floor, Crossroads Tower, Salt Lake City, UT 84144 |
| Lehi | Western States Energy, Atlas Powder, 15301 Dallas Parkway, Suite 1200, Dallas, TX 75248 |

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| Utah cont. | |
| Ogden | Defense General Supply, 8000 Jefferson Davis Hwy, Richmond, VA 23297 |
| Ogden | A & B Chemical Co., 2931 Second Ave., Suite 100, Richmond, VA 23222 |
| Utah County | Dyno Nobel, formerly Cook Associates, 2026 Beneficial Life Tower, Salt Lake City, UT 84111 |
| Salt Lake City | Hanex Products, 466 W. 200 South, Salt Lake City, UT 84101 |
| Virginia | |
| Richmond | 2931 Second Ave., Richmond VA 23222 |
| Gainesville | Atlantic Research, 5945 Wellington Rd., Gainesville, VA 22065 |
| Pepper | Hercules, Inc. (see Alliant Tech Utah address) |
| Yorktown | Defense General Supply, 8000 Jefferson Davis Hwy, Richmond, VA 23297 |
| Duffield | Paige Ireco (formerly Gibson Explosives), PO Box 33, Duffield, VA 24244 |
| Washington | |
| Olympia | Ireco Inc. (formerly Pacific Powder), 628 Columbia NW, Suite 1-A, Olympia, WA 98501 |
| West Virginia | |
| Rocket Center | Alliant Techsystems, 210 Star Route 956, Rocket Center, WV 26725 |
| Newell | Newell Specialties, State Route 2, Newell, WV 26050 |
| Romney | Appalachian Explosives, An/Gel Int., 33 C St., Salt Lake City, UT 84103 |
| Wisconsin | |
| Delafield | Bartolottas Fireworks, PO Box 5, Genesee Depot, WI 53127 |
| Wyoming | |
| Mills | Thermex (formerly Gulf), 13601 Preston Rd., Suite 900 West, Dallas, TX 75240 |